



# **AHRQ/HRET Audio Conference Series for State Hospital Associations:**

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Quality Indicators and Their Use in  
Improving Quality of Care and  
Patient Safety

May 18, 2010



# Audio Conference Presenters

- **John Bott:** AHRQ Quality Indicators Measure Expert, Center for Delivery, Organization and Markets
- **H. Joanna Jiang, PhD:** AHRQ Senior Social Scientist, Center for Delivery, Organization and Markets
- **Patrick S. Romano, MD, MPH:** Professor of Medicine and Pediatrics, UC Davis Division of General Medicine
- **Stephen Hines, PhD:** Vice President, Research, HRET (moderator)



# Audio Conference Overview

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- John Bott will provide background information on the QIs as well as their general uses
- Dr. Patrick Romano will discuss a variety of the PSIs and how they can be used to improve quality at the hospital level
- Joanna Jiang, PhD, will discuss the inception of a toolkit based on the QIs
- Steve Hines, PhD, will discuss next steps with HRET regarding the QIs and will open the Q&A session
- Please see Appendix A (slide 61) and Appendix B (slide 70)



# **AHRQ Quality Indicators 101: Background and Introduction to the AHRQ QIs**

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*John Bott, Contractor, Agency for Healthcare Research  
and Quality*

*May 18<sup>th</sup>, 2010*



# AHRQ Quality Indicators (QIs)

- Developed through contract with UCSF-Stanford Evidence-based Practice Center and UC Davis
  - Healthcare Cost and Utilization Program (HCUP) data used in measure development, maintenance & improvement
  - Currently HCUP data consists of 43 states containing over 90 of hospital discharges
- Use existing hospital discharge data, based on readily available data elements, e.g.:
  - ICD-9-CM\* diagnosis & procedure codes, Diagnosis Related Groups (DRG), Medicare DRGs, Major Diagnostic Categories (MDC), sex, age, procedure dates, admission type, admission source, discharge disposition, discharge quarter, point of origin, present on admission
- Incorporate a range of severity adjustment methods, including APR-DRGs\*\* and comorbidity groupings

\* International Classification of Diseases, Ninth Revision, Clinical Modification

\*\* All Patient Refined - Diagnosis Related Groups

# AHRQ Quality Indicators

## Inpatient QIs

*Mortality,  
Utilization,  
Volume*

## Prevention QIs

*(Area Level)  
Avoidable  
Hospitalizations /  
Other Avoidable  
Conditions*

## Pediatric QIs

**Neonatal  
QIs**

## Patient Safety QIs

*Complications,  
Unexpected Death*

*See App. A  
for list of  
measures*



# Features of the AHRQ QIs

## ■ Public Access

- All development documentation and details on each indicator available on Web site
- Software available to download at no cost
  - Documentation and software at:  
[www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)
- Standardized indicators: Hospitals can replicate data
- Can be used with any administrative data, e.g. HCUP, MEDPAR\*, State data sets, payer data, hospital internal data
- Indicator maintenance and updates
- Tools and technical assistance

\* Medicare Provider Analysis and Review (Medicare administrative inpatient data)



# Features of the AHRQ QIs (cont.)

- National benchmarks:
  - National Healthcare Quality Report
  - National Healthcare Disparities Report
  - HCUPnet
  
- Scope
  - Over 90 individual measures
  - Each measure can be stratified, e.g.: race, age, sex, provider, geographic region
  - Include priority populations and areas, e.g.: child health, women's health (pregnancy and child-birth), diabetes, hypertension, patient safety, preventive care



# Current limitations & challenges

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- Outcomes data less actionable than processes
- Limited clinical detail
- Risk adjustment challenges
- Accuracy hinges on accuracy of documentation and coding
- Data potentially subject to gaming
- Time lag of the data



# Recent improvements

- Composite measures
  - Developed composite measures for the IQIs, PSIs, PQIs and PDIs
- Risk adjustment based on administrative data
  - Additional risk adjustment methods for AHRQ QIs
- Updated literature reviews
  - Completed IQIs, PDIs and PSIs
- Reporting template
  - Tested and refined
- National Quality Forum review and endorsement of a number of the QIs
  - See App. B for list of NQF endorsed measures
- Use of present on admission and point of origin data



# General uses of the AHRQ QIs

- Hospital quality improvement efforts
  - Individual hospitals & health care systems, such as:
    - Banner Health (a multi-hospital system in AZ)
    - Norton Healthcare (a multi-hospital system in KY)
    - Baycare Health System (a multi-hospital system in FL)
    - Ministry Health Care (a multi-hospital system in WI)
  - Hospital association member based reports, such as:
    - University Healthsystem Consortium
    - Dallas - Fort Worth Hospital Council
    - Premier (note: Premier participating in CMS pay for performance demonstration, which includes AHRQ QIs)



# General uses of the AHRQ QIs

- Aggregate reporting: National, state, regional
  - National Healthcare Quality / Disparities Reports
  - Commonwealth Fund's Health Performance Initiative
  
- Research
  - Tracking quality of care for populations over time and across areas
  - Tracking disparities in care over time and across areas
  - Comparing quality between different types of hospitals or hospital systems (e.g., size, volume, teaching status, ownership, accreditation, critical access status)
  - Evaluating impact of interventions to reduce costs or improve quality (e.g., resident work hours reform, electronic health information systems, hospital mergers and consolidations)



# General uses of the AHRQ QIs

- Value based purchasing / pay for performance (P4P)
  - CMS - Premier Demo
  - Anthem of Virginia
  - The Alliance (Wisconsin)
  
- Hospital level public reporting
  - Currently: Statewide public reporting (*upcoming slide*)
  - Upcoming: CMS Hospital Compare, including Veterans Affairs medical centers (*upcoming slide*)
  
- Hospital profiling: Public reporting and P4P
  - Blue Cross / Blue Shield of Illinois





# Centers for Medicare & Medicaid Services (CMS) Hospital Compare

Hospital Compare is a public report of 4,500+ hospitals produced by CMS

A number of AHRQ QIs (below) to be added Dec. 2010

## ■ Individual measures

- Death among surgical inpatients with serious treatable complications
- Iatrogenic pneumothorax
- Postoperative wound dehiscence
- Accidental puncture or laceration
- AAA repair mortality
- Hip fracture mortality

## ■ Composites

- Patient safety for selected indicators
- Mortality for selected conditions

*(See next slide for measures within each composite)*



# CMS Hospital Compare (cont.)

- Composite: Patient safety for selected indicators
  - Pressure ulcers
  - Iatrogenic Pneumothorax
  - Central venous catheter-related bloodstream infections
  - Postoperative hip fracture
  - Postoperative pulmonary embolism or DVT
  - Postoperative sepsis
  - Postoperative wound dehiscence
  - Accidental puncture or laceration
  
- Composite: Mortality for selected conditions
  - AMI mortality
  - CHF mortality
  - Acute stroke mortality
  - GI hemorrhage mortality
  - Hip fracture mortality
  - Pneumonia mortality



# AHRQ QI measurement work: Where we are at

- Release of Windows QI version 4.1
  - Estimate the release of the software in late June 2010
  
- In progress
  - Emergency Preparedness
  - PQI measure development for the Medicaid Home and Community Based Services Population
  - Assessment of PQIs for pay for performance
  
- Recently began
  - Efficiency measure development
  - Care coordination measure development
  - Emergency dept. PSI measure development
  - Emergency dept. PQI measure development
  - Refinement activity: Present on admission
  
- Near Future
  - Refinement Activity: Lab values



# For more information...

- Web site: <http://qualityindicators.ahrq.gov>
  - QI documentation and software are available
  - Sign up for AHRQ QI listserv
  
- Support E-mail: [support@qualityindicators.ahrq.gov](mailto:support@qualityindicators.ahrq.gov)
  
- Support Phone: (888) 512-6090 (voicemail)
  
- Staff: Mamatha Pancholi [Mamatha.Pancholi@ahrq.hhs.gov](mailto:Mamatha.Pancholi@ahrq.hhs.gov)  
John Bott [John.Bott@ahrq.hhs.gov](mailto:John.Bott@ahrq.hhs.gov)



*Agency for Healthcare Research and Quality*

*Advancing Excellence in Health Care*

[www.ahrq.gov](http://www.ahrq.gov)

# How the AHRQ Quality Indicators are Used to Drive Quality Improvement at the Hospital Level

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Patrick S. Romano, MD MPH

UC Davis Center for Healthcare Policy and Research

Hospital Research and Education Trust

May 18, 2010



# Moore Demonstration Project (MDP)

- Goal 1: To develop a collaboration with 3 northern CA hospitals to collaboratively review cases flagged by PSIs
- Goal 2: To provide information useful for improving coding and quality of care in the future
- Retrospective cross-sectional design
- Consecutive sampling using AHRQ QI software to identify up to 100 cases of  $\geq 4$  PSIs at each hospital (10/07-2/09)
- “Present on admission” (POA) logic was used in V3.2, March 2008 software to reduce false positives
- Each hospital identified RN or MD abstractors, who were trained to use “root cause” PSI tools and guidelines
- UC Davis entered data, identified discrepancies, and performed descriptive analysis of opportunities for QI



# PSI 6: Iatrogenic pneumothorax MDP opportunities for improvement

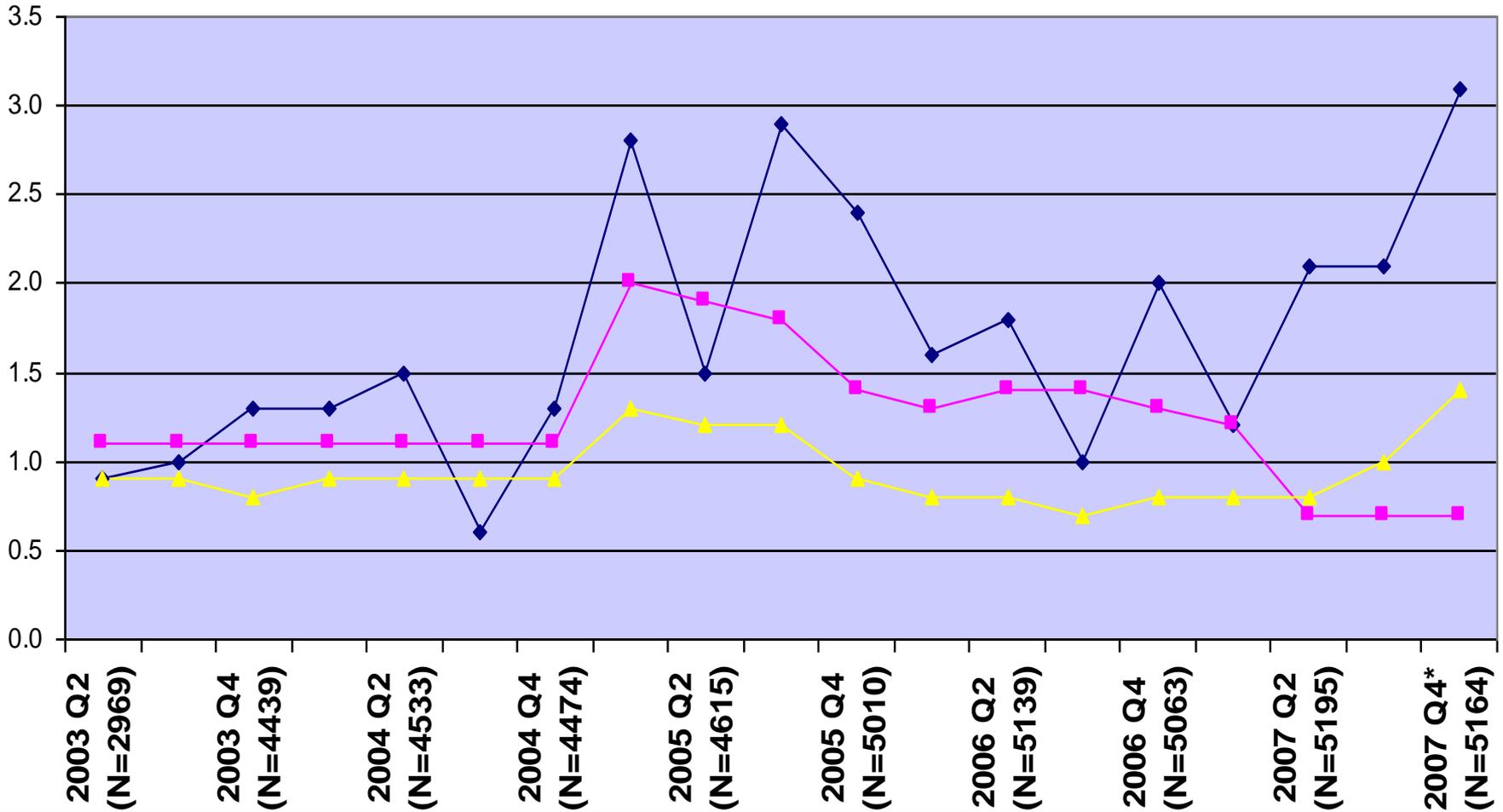
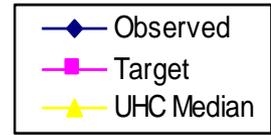
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- Watch for inadequate documentation, such as “rule out” pneumothorax without alternative diagnosis established after study (CXR or CT)
- Increase use of “bedside” ultrasound guidance during placement of central venous catheters, especially in the OR, ICU, and ED (proven to reduce iatrogenic injury during IJ placement)



# Case study: Iatrogenic pneumothorax

AHRQ Patient Safety Indicators  
Iatrogenic Pneumothorax  
Rate per 1000





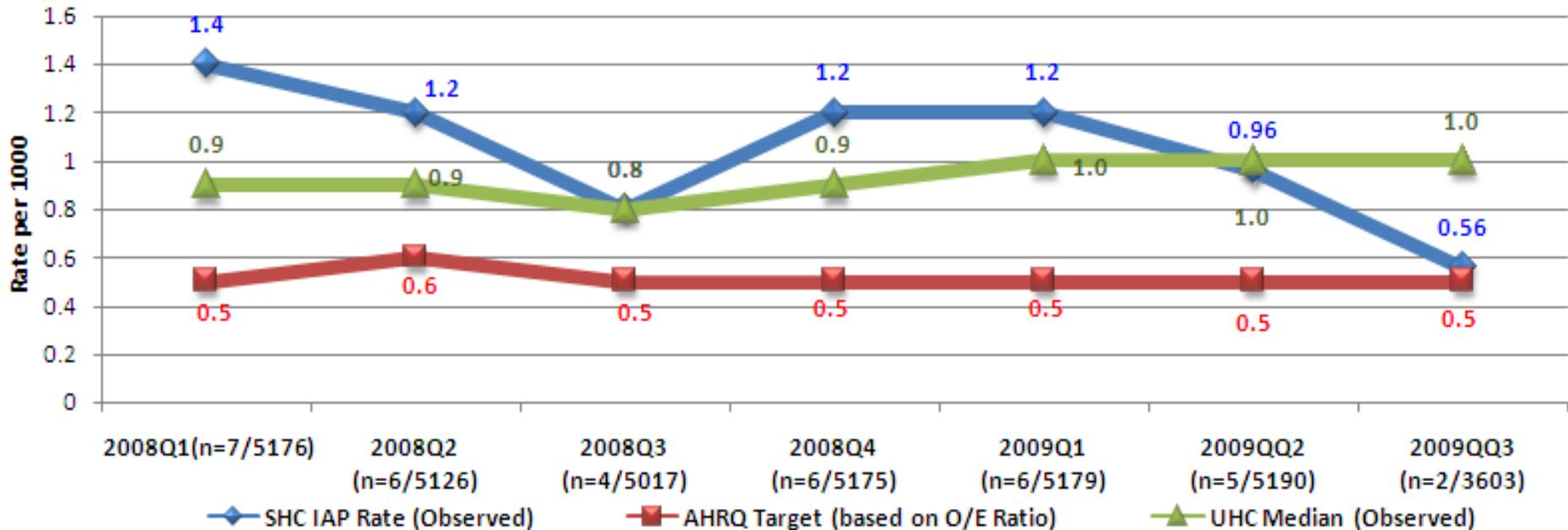
# Action Plan for Iatrogenic Pneumothorax

**GOAL: Reduce the rate of iatrogenic pneumothorax (IAP) from central venous catheterization (CVC) by 50% by 6 months.**

Action	Agent	Timeline
<p>Promote ultrasound-guided internal jugular (IJ) catheterization as the method of choice for CVC</p> <p>Limit use of subclavian approach (with faculty supervision) to:</p> <ul style="list-style-type: none"> <li>• access to the neck is limited (e.g., trauma/code resuscitations)</li> <li>• patients with suspected neck injuries</li> <li>• lack of other available sites</li> </ul> <p>Ensure availability of ultrasound equipment</p>	<ul style="list-style-type: none"> <li>• L. Shieh to revise CVC Website Curriculum &amp; Simulation Program to further promote IJ approach</li> <li>• Drs. Maggio, Williams, Mihm &amp; Lee to educate ED, OR &amp; General Surgery. Drs. Mihm, Riskin and Daniels to educate ICU. Dr. Shieh to educate B2 &amp; D1.</li> <li>• I. Tokareva to develop &amp; distribute educational materials to reinforce</li> </ul>	<p>Start Jan 22 &amp; ongoing</p>
<p>Require all medical &amp; surgical interns to complete CVC Website Curriculum &amp; Simulation Program during orientation (“Bootcamp” for surgical interns)</p>	<ul style="list-style-type: none"> <li>• Drs. Shieh, Maggio, Williams, Mihm &amp; Lee</li> <li>• Monitor quarterly IAP rates for impact</li> </ul>	<p>June 30</p>

# Iatrogenic Pneumothorax (IAP) Data

SHC Patient Safety Indicator (PSI06)(Rate per 1000)  
Iatrogenic Pneumothorax (Data source: UHC)  
CY 2008Q1-2009Q3

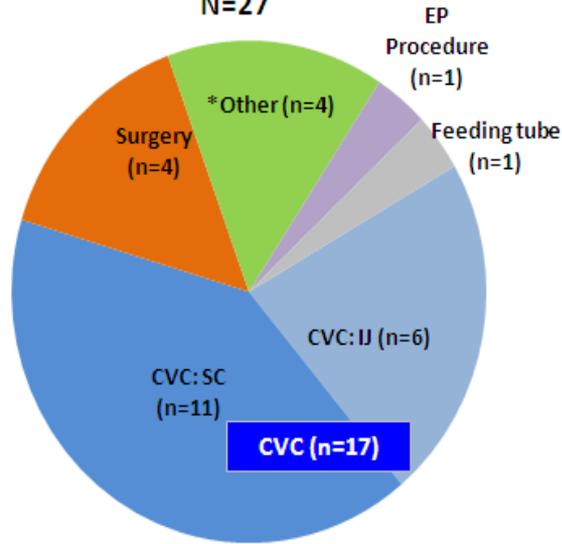


## Findings

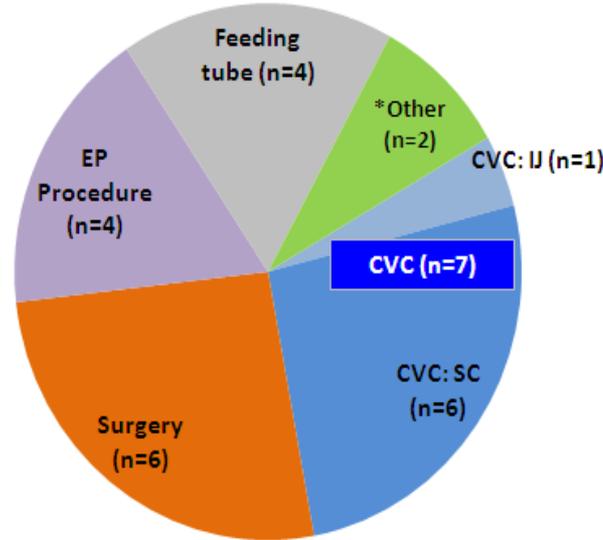
- Overall SHC IAP rate per 1000 discharges is trending down
- The best performance occurred in 2009Q3 with SHC IAP rate of 0.56 per 1000 inpatient discharges, but this remains slightly above target. Please note that if 2 cases in 2009Q3 are recoded and removed, SHC IAP rate would be at zero.

# Iatrogenic Pneumothorax (IAP) Data

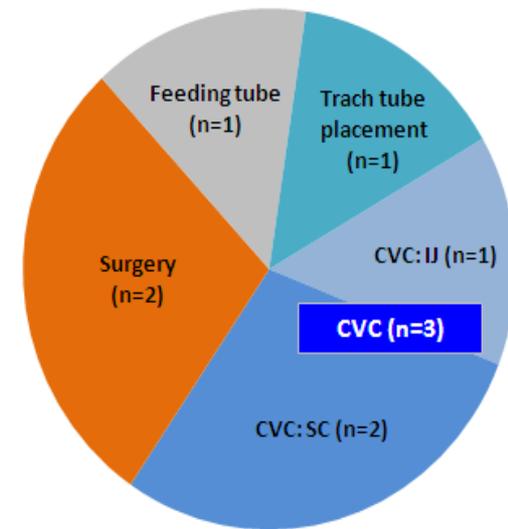
IAP by Apparent Cause  
CY 2007  
N=27



IAP by Apparent Cause  
CY 2008  
N=23



IAP by Apparent Cause  
CY 2009 Q1-Q3  
N=7



## Findings

- Overall IAP CY 2007-2009 rate is trending down
- 70% of CVC cases were due to SC (19/27)
- \* Other – infrequent causes of IAP (occurred 1 time per service per cause)



# From one AMC to the nation

- About 14 pneumothoraces were prevented at one AMC in CY 2009
- Extrapolating from RCT findings and 2004 HCUP data, at least 1725 of the 14729 reported pneumothoraxes among hospitalized adults in nonfederal hospitals and at least 431 of 3682 additional outpatient-acquired but hospital-treated pneumothoraxes could have been prevented through universal use of ultrasound during IJ cannulation
- Each pneumothorax adds (on average) 4.4 inpatient days and \$17 312 in hospital charges



## PSI 7: CVC-related bloodstream infection MDP opportunities for improvement

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- Identify tunneled catheters that are infected at admission and code as POA
- Minimize use of femoral venous catheters, which are associated with higher rates of infection
- Remove catheters at earliest opportunity consistent with patient safety



# Case study: CVC-related bloodstream infection

## ORIGINAL INVESTIGATION

### Use of Simulation-Based Education to Reduce Catheter-Related Bloodstream Infections

Jeffrey H. Barsuk, MD; Elaine R. Cohen, BA; Joe Feinglass, PhD; William C. McGaghie, PhD; Diane B. Wayne, MD

**Background:** Simulation-based education improves procedural competence in central venous catheter (CVC) insertion. The effect of simulation-based education in CVC insertion on the incidence of catheter-related bloodstream infection (CRBSI) is unknown. The aim of this study was to determine if simulation-based training in CVC insertion reduces CRBSI.

**Methods:** This was an observational education cohort study set in an adult intensive care unit (ICU) in an urban teaching hospital. Ninety-two internal medicine and emergency medicine residents completed a simulation-based mastery learning program in CVC insertion skills. Rates of CRBSI from CVCs inserted by residents in the ICU before and after the simulation-

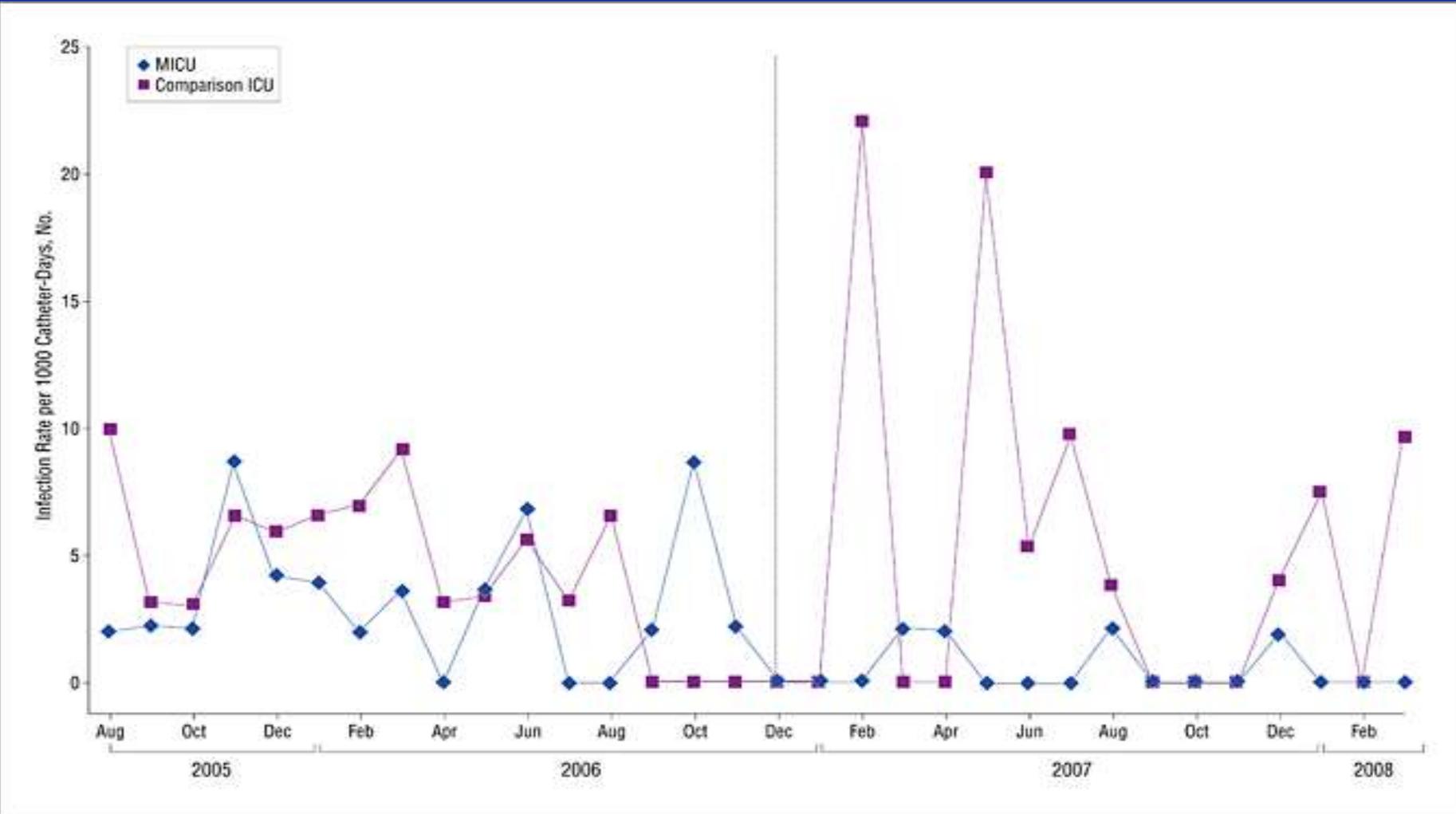
based educational intervention were compared over a 32-month period.

**Results:** There were fewer CRBSIs after the simulator-trained residents entered the intervention ICU (0.50 infections per 1000 catheter-days) compared with both the same unit prior to the intervention (3.20 per 1000 catheter-days) ( $P = .001$ ) and with another ICU in the same hospital throughout the study period (5.03 per 1000 catheter-days) ( $P = .001$ ).

**Conclusions:** An educational intervention in CVC insertion significantly improved patient outcomes. Simulation-based education is a valuable adjunct in residency education.

*Arch Intern Med.* 2009;169(15):1420-1423

# Case study: CVC-related bloodstream infection



Barsuk, J. H. et al. Arch Intern Med 2009;169:1420-1423.



# PSI 9: Postoperative hemorrhage/hematoma MDP opportunities for improvement

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- Logic of indicator may capture both intraoperative and postoperative hemorrhage (especially if bleeding persists after surgery)
- Impact of true positive cases was significant (i.e., most returned to OR), but opportunities for improvement are unclear



# Case study from one AMC

AHRQ PSI	Coding problem	Definition problem	Potential Clinical Issue
Pneumothorax	5 (12%)	0 (%)	38 (88%)
Postoperative Hemorrhage or Hematoma	3 (8%)	10 (26%)	26 (67%)
Postoperative PE / DVT	12 (30%)	0 (0%)	28 (70%)



# PSI 10: Postoperative physiologic/metabolic MDP opportunities for improvement

## Postoperative renal failure requiring dialysis

- Earlier recognition of renal failure may be beneficial
- Evaluate use of nephrotoxic medication, especially NSAIDs in postoperative setting
- Review ionic contrast documentation & use

## Postoperative diabetic complications

- Tighter blood sugar control and monitoring in type I DM post-operatively
- Consider insulin drips instead of implanted pumps and/or SQ in the immediate postop period



# PSI 11: Postoperative respiratory failure MDP opportunities for improvement

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- Avoid using 96.04 code when intubation is an expected part of procedure
- Two cases of oversedation leading to respiratory complications
- Reasons for re-intubation or prolonged ventilation were often not documented
- Some patients probably could have been extubated earlier (and would then not have counted as respiratory failure)



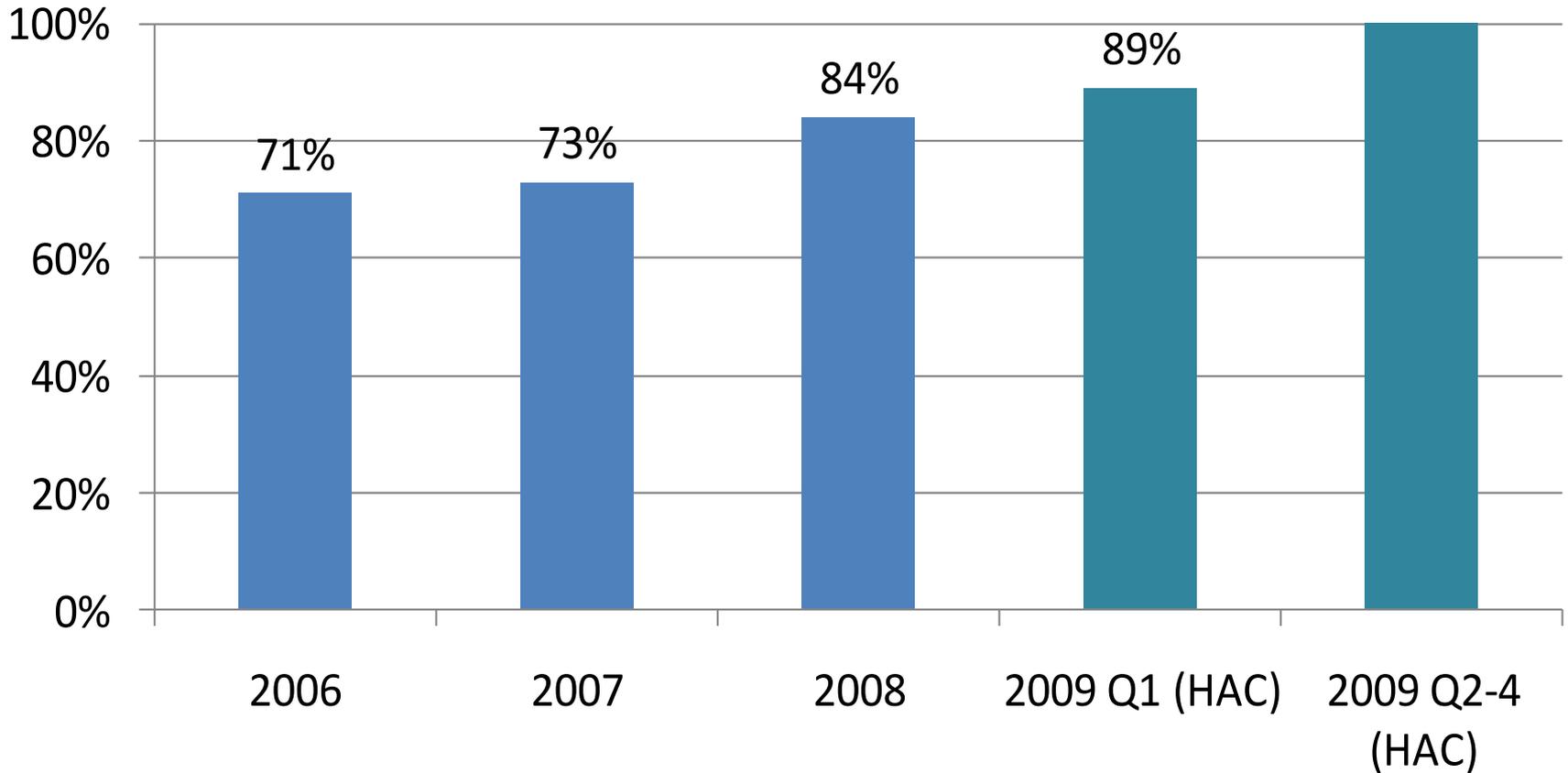
# PSI 12: Postoperative DVT/PE MDP opportunities for improvement

- Watch for inadequate documentation, such as “rule out” DVT or PE without alternative diagnosis established after study
- Use new ICD-9-CM codes to capture chronic VTE
- More timely (day 0) use of pharmacologic prophylaxis may be beneficial, especially for perioperative patients at intermediate risk and without contraindications (consider adequacy of mechanical prophylaxis alone)



# Case study: Postop DVT/PE Coding Accuracy

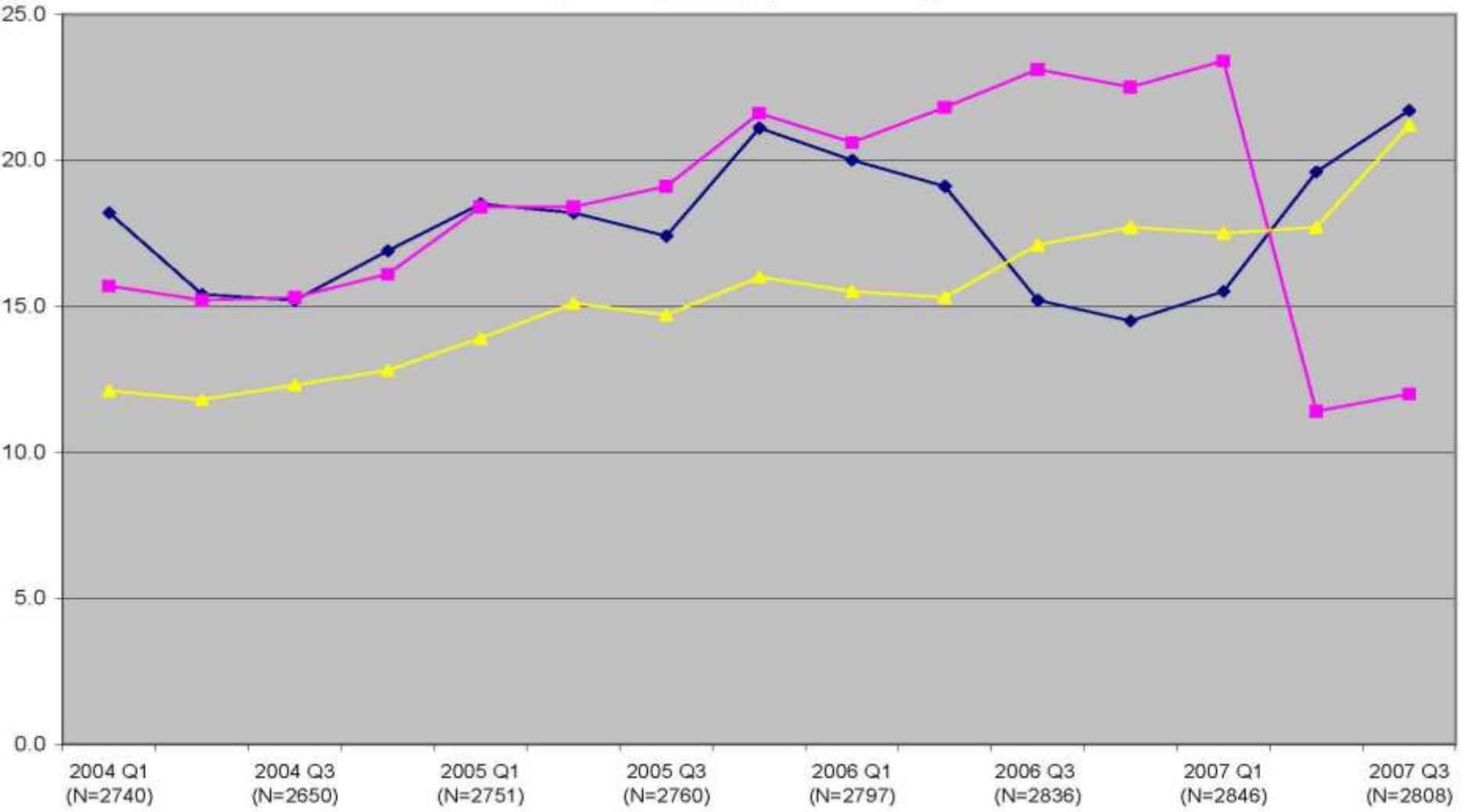
## Coding Accuracy



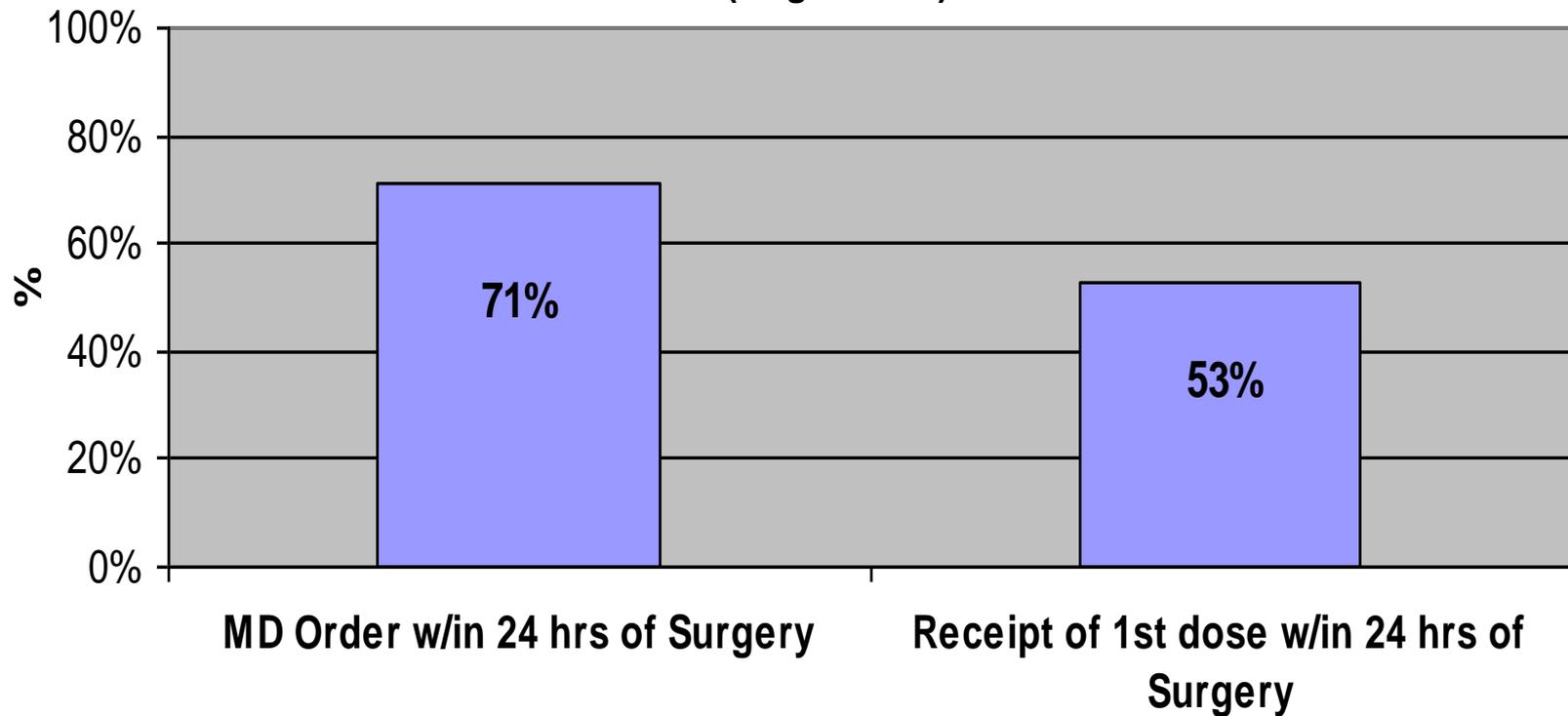
# Case study: Postoperative DVT/PE

**AHRQ Patient Safety Indicators**  
**Post Operative DVT or PE**  
 Rate per 1000 Surgical Inpatient Discharges

● Observed  
 ■ Target  
 ▲ UHC Median



## Postoperative Drug Prophylaxis Ordered and 1st Drug Dose Administered within 24 Hours of Surgery (N=17) (Aug-Oct 08)





# Action Plan for Postoperative DVT/PE

**Goal: Reduce the rate of DVT & PE by 25% by December 2008.**

Action	Agents	Timeline
Monitor concurrent MD ordering practices of DVT prophylaxis & educate/reinforce Epic order sets.	Quality Specialist to audit 10 charts/wk of General & Ortho Surgery pts & educate MDs.	Begin Feb 1
Review concurrent DVT/PE cases for adherence to DVT prophylaxis guidelines monthly.	Quality Specialist to perform audit based on monthly report of + radiology tests.	Feb 18
Examine & present results from concurrent monitoring & audit & NSQIP data to providers.	P. Pilotin & K. Bashaw to discuss results with Chairs of General & Orthopedic Surgery.	Feb 25
Educate physicians to DVT guidelines and order sets.	P. Pilotin to develop/distribute materials of DVT guidelines & screen shots of Epic DVT order set.	Feb 15
Establish rules & rates for DVT/PE cases for individual MD profiles.	Quality Dept to establish rules & rates in Midas.	March 31
Refine DVT prophylaxis guidelines for medical patients.	K. Posley to review/revise guidelines.	Feb 1



# Concurrent Surgical Audit

- Concurrent audit started in Feb 08; conducted by Quality Specialist 24 hours after surgery on orthopedic surgery and general surgery patients
- “Risk level” of patient is assessed by Quality Specialist & compliance determined based on current order
- Surgical DVT Prophylaxis must be ordered and 1st drug dose given within 24 hours after surgery
- If no order or inadequate order, a “fix-it” ticket is placed in medical record so MD can order or revise prophylaxis

**DVT**  
DVT Prophylaxis "Fix it Ticket"

Today's Date: \_\_\_\_\_  
Patient Name: \_\_\_\_\_  
MRN: \_\_\_\_\_  
Unit: \_\_\_\_\_  
Attending MD: \_\_\_\_\_  
Resident: \_\_\_\_\_

Dear Physician:

As soon as possible, please either:

- Order DVT Prophylaxis:  
Pharmacologic agent  
Mechanical compression

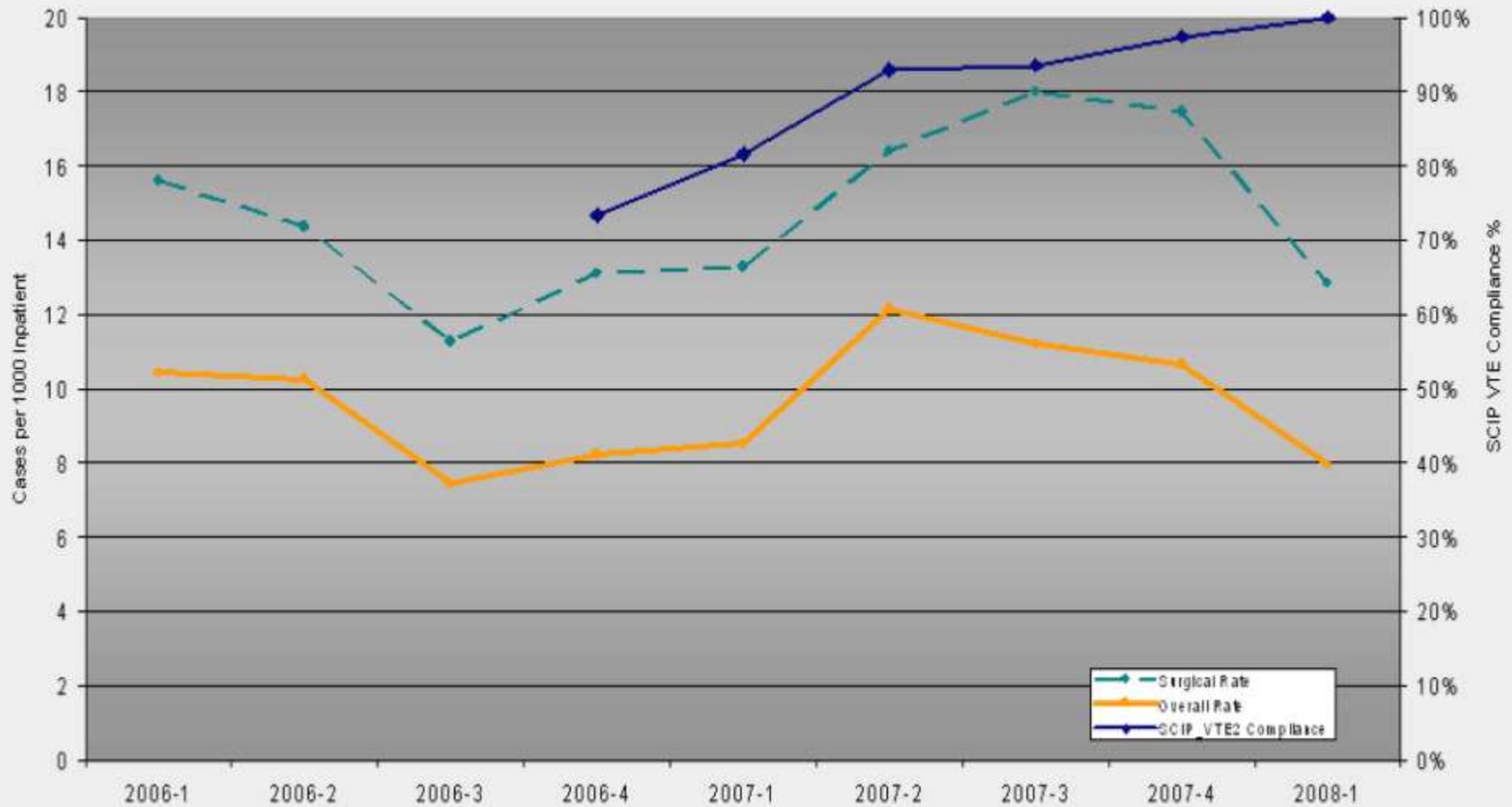
OR,

- Document a contraindication to DVT Prophylaxis.

Thank you for providing quality care to your patient!

**Any questions?**  
Please call our DVT Prophylaxis Specialist:  
Julie Wahlig, RN MA at Ext. 1-6180 or Pager 16621

**Incidence of DVT/PE by DRG Type with SCIP VTE Compliance**  
(Qtr 1 06 to Qtr 1 08)





# DVT/PE Risk Assessment in Epic

Poodle, Cdmia MRN: 20083572 Rm-Bd B101-B101A Sex F DOB: 6/1/1970 Age: 37 Y Ht: 152.4 cm (5') Last Wt: 190.1 kg (419 lb) Code PAR Isolation Contact and Allergies(12/3/07) STRAWBERRY, PENIC Language Mandarin Attending Raffin, Thomas\* FYI

Order Set (Contact Date: 7/17/2007) Close X

**Order Set**

- Order Sets
- Orders

**IP GEN VTE PROPHYLAXIS**

[Learn more about DEEP VENOUS THROMBOSIS PREVENTION at the LaneConnex Internal Medicine portal](#)

**VTE PROPHYLAXIS**

Hyperlink(place holder) Risk Assessment Tool/VTE Prophylaxis Guidelines for Surgery

**Low Risk DVT/PE Prophylaxis: (<5% risk of DVT: Patient <40 years old and minor surgery and no additional risk factors)**

- (Low Risk, No Pharmacological VTE Prophylaxis Indicated) Routine, ONCE
- Sequential Compression Device (SCD) Routine, ONCE

**Moderate Risk DVT/PE Prophylaxis (10-20% risk of DVT: Patient 40-60 years old with no additional risk factors or minor surgery in patients with additional risk factors)**

- enoxaparin (LOVENOX) 40 mg/mL syringe 40 mg, SUBCUTANEOUS, DAILY
- heparin 10,000 units/mL injection (for subcut) 5000 Units, SUBCUTANEOUS, EVERY 12 HOURS
- Sequential Compression Device (SCD) Routine, ONCE

**High Risk DVT/PE Prophylaxis: (20-40% risk of DVT: Surgery in patients >60 years old or age >40 years with additional risk factors)**

- enoxaparin (LOVENOX) 30 mg/mL syringe 30 mg, SUBCUTANEOUS, 2 TIMES DAILY
- enoxaparin (LOVENOX) 40 mg/mL syringe 40 mg, SUBCUTANEOUS, DAILY
- heparin 10,000 units/mL injection (for subcut) 5000 Units, SUBCUTANEOUS, EVERY 8 HOURS
- Sequential Compression Device (SCD) Routine, ONCE

**Highest Risk DVT/PE Prophylaxis: (40-80% risk of DVT: Surgery in patients with multiple risk factors or hip or knee arthroplasty, hip fracture surgery, major trauma or spinal cord injury) Warfarin started day of surgery, target INR 2-3**

- enoxaparin (LOVENOX) 30 mg/mL syringe 30 mg, SUBCUTANEOUS, 2 TIMES DAILY
- fondaparinux (ARIXTRA) 2.5 mg/0.5 mL syringe 2.5 mg, SUBCUTANEOUS, DAILY
- warfarin (COUMADIN) tablet Oral, DAILY
- Sequential Compression Device (SCD) Routine, ONCE

**VTE Adjunct Orders**

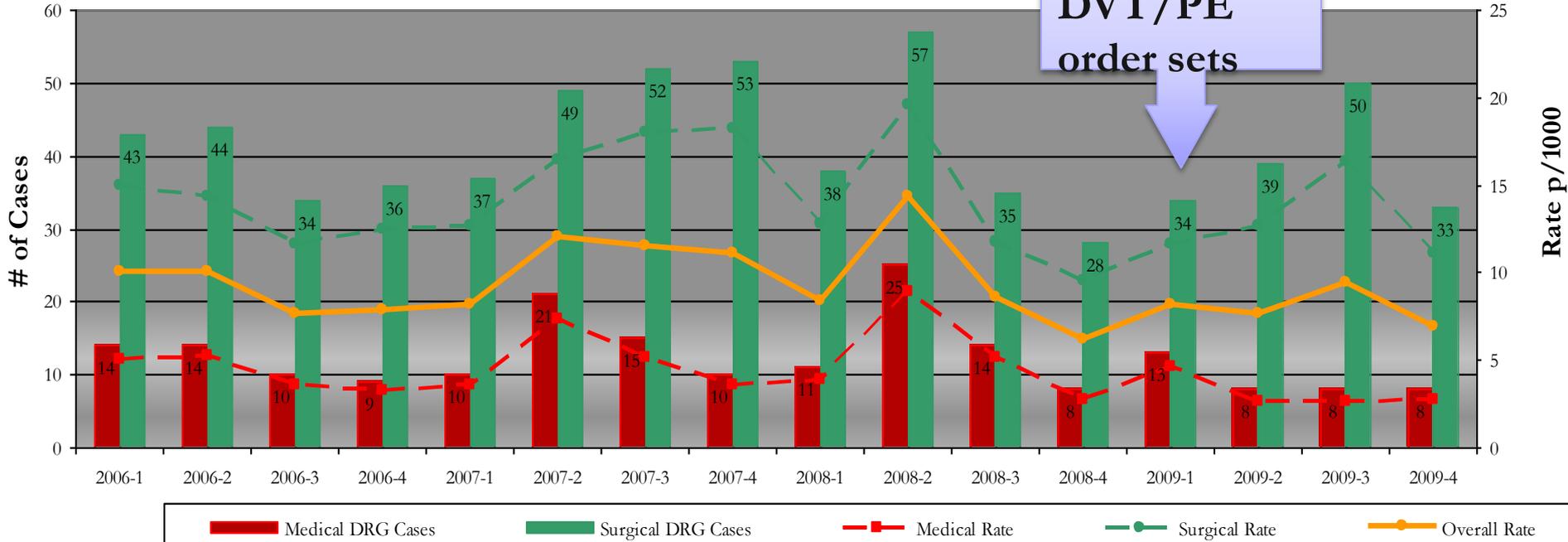
- Early Ambulation Routine, AS TOLERATED



# Case study: Too soon to declare victory

Incidence of DVT/PE by MS-DRG Type  
(CY 2006 Q1 to 2009 Q4)

Implemented  
DVT/PE  
order sets

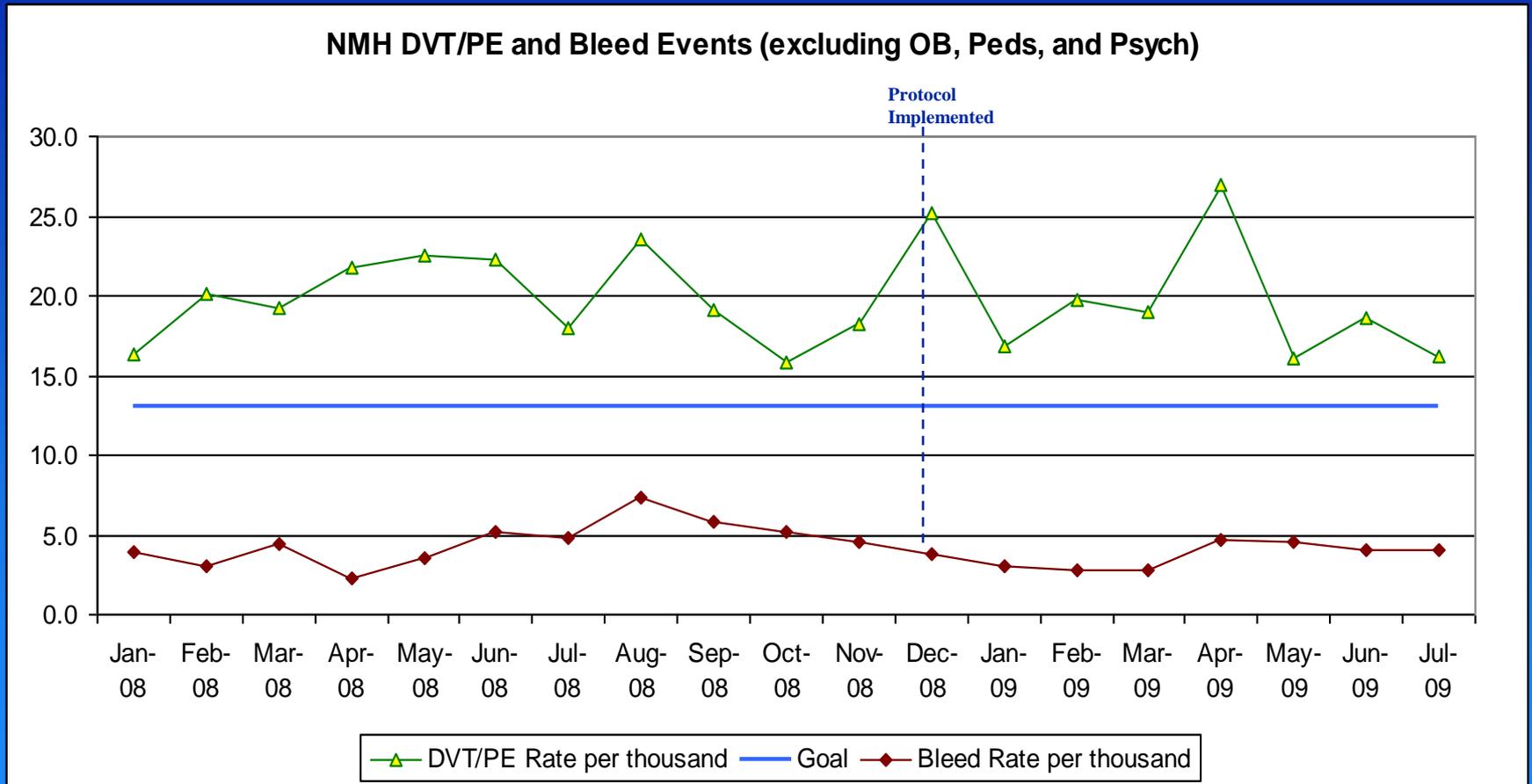



## Findings/Actions

- ❑ Overall incidence of hospital-acquired DVT/PE reflects a downward trend
- ❑ Review process for fall-out cases expanded to identify improvement opportunities
- ❑ Leverage Epic reports to provide real time data
- ❑ Monitor compliance with order set and address non compliance



# Case study from another AMC



Source: EPSI Coded Diagnosis Data

Excludes patients with DVT/PE Present on Admission

Bleeding Data represents patients that had a bleeding complication due to an anticoagulant



## PSI 15: Accidental puncture or laceration MDP opportunities for improvement

- Occasional overcoding of intraoperative bleeding or other routine events as APL
- Most true positive cases had extenuating circumstances, although some were probably preventable with earlier conversion of laparoscopic to open abdominopelvic surgery, or use of Doppler ultrasound to identify structures
- Hospitals with inexperienced operators performing technically difficult procedures may experience patterns of similar events



# Acknowledgments and references

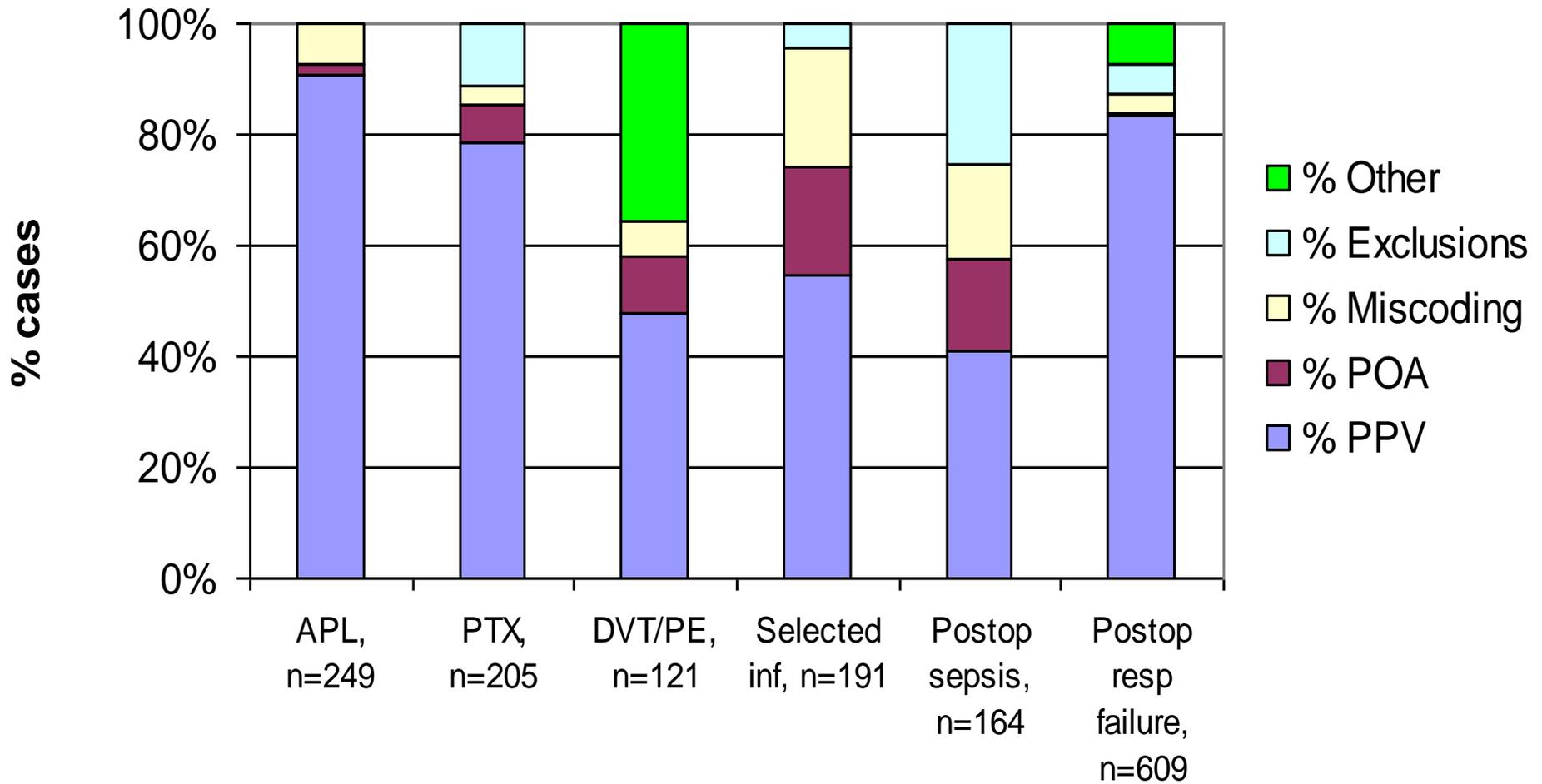
- AHRQ Quality Indicators project team: Mamatha Pancholi, John Bott
- Gordon and Betty Moore Foundation
- UC Davis: Garth Utter, Banafsheh Sadeghi, Pat Zrelak, Ruth Baron, Richard White
- MDP partners: Stanford University Medical Center, San Francisco General Hospital, Sutter Roseville Medical Center
- UHC team: Joanne Cuny, Pradeem Sama, Michael Silver and Cynthia Barnard (Northwestern University Medical Center), Martha Radford (NYULMC)
- Utter GH, et al. Positive predictive value of the AHRQ Accidental Puncture or Laceration Patient Safety Indicator. *Ann Surg* 2009; 250(6):1041-5.
- Sadeghi B, et al. Cases of iatrogenic pneumothorax can be identified from ICD-9-CM coded data. *Am J Med Qual* 2010; 25(3);211-7.
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# PSI Validation Methods

- Gather evidence on the criterion validity of the PSIs based on medical record review as “gold standard”
- Improve guidance about how to interpret & use the indicators, especially for quality improvement
- Retrospective cross-sectional study design
- Volunteer sample of 47 partners (78% nonprofit, nonreligious) plus parallel study of 28 VA hospitals by Rosen et al.
- Sampling based on administrative data using AHRQ QI software to generate desired sample size locally (30 per hospital) and nationally (240 per PSI) from 2006-7
- Coordinated with UHC on Clinical Benchmarking Projects (involving volunteer AMCs) for Postop DVT/PE, Postop Respiratory Failure, and Pressure Ulcer.

# Summary of PPV estimates from community hospitals





# **AHRQ Quality Indicators Toolkit**

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**H. Joanna Jiang, Ph.D.**

**Center for Delivery, Organization and Markets, AHRQ**

**May 18<sup>th</sup>, 2010**



# Why do we need a toolkit?

- AHRQ QIs are increasingly used in hospital-level public reporting.
  - Currently in 19 states
  - CMS will add 6 individual QIs and 2 composites to Hospital Compare
- For real changes to happen, need to incorporate the QIs into hospital quality improvement interventions.
- There have been some successful examples (e.g., University HealthSystem Consortium).
- But many hospitals have limited experience using the QIs.



# Who would be the audience?

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- Hospitals and health systems.
- Two distinct audiences are considered:
  - Hospitals that have established expertise and resources in quality improvement.
  - Others that are less sophisticated with more limited resources.



# What is the purpose and scope of the toolkit?

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- A useful and usable resource to support hospitals in their efforts to improve performance on two sets of the AHRQ QIs – Inpatient Quality Indicators (IQI) and Patient Safety Indicators (PSI)



# What are the objectives?

- Specific objectives to achieve through use of the toolkit:
  - Incorporate the AHRQ QIs into hospital quality improvement efforts to produce measurable impact on improving quality of care and patient safety .
  - Share successful implementation strategies as well as potential challenges that need to be addressed.
  - Broadly disseminate the tools and evidence of the value of using the AHRQ QIs in quality improvement



# What will be included?

1. Assessing Readiness to Change:
  - Getting to know the IQI and PSI.
  - Presentation to the Board and hospital leadership
  - Self-assessment on readiness for change (e.g., organizational structure, priority, senior leadership, data systems, skills and knowledge, experience with the QIs)
  
2. Applying the QIs to the Hospital Data
  - Guidance on how to prepare data, run the software, review the output, and understand the rates



# What will be included? (cont.)

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3. Identifying Priorities for Quality Improvement
  - Methods to compare the QIs with benchmarks.
  - Report formats to display and communicate the results
  - Prioritization matrix to decide on which QIs to address
  
4. Implementing Evidence-Based Best Practices
  - Evaluating current systems, protocols, processes
  - Implementation team and goals
  - Identifying and implementing best practices
  - Measuring progress



# What will be included? (cont.)

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5. Return-on-Investment Analysis
  - Instructions on performing ROI analysis
  - ROI worksheet
  - Examples
  
6. Ongoing Monitoring and Sustainability of Improvement
  - Meaningful measures for use in regular monitoring of performance on the QIs
  - Reporting process and formats



# Who are involved in this work?

- RAND Corporation
- University HealthSystem Consortium (UHC)
- Advisory Panel
  - Gregg Meyer, MD, MSc (MA General Hospital)
  - Martha Radford, MD (NYU Langone Medical Center)
  - Donald Goldmann, MD (Institute for Healthcare Improvement)
  - Denise Remus, PhD, RN (BayCare Health System)
  - Stephen R. Mayfield, DrHA, MBA, MBB (AHA)
  - Sheri L. Eisert, PhD (Denver VAMC HSR&D)
- Six Hospitals that participate in testing the toolkit
- H. Joanna Jiang, Ph.D. (AHRQ Task Order Officer)



# What is the timeline?

- Literature review (Aug - Oct 2009)
- Develop the toolkit (Nov 2009 – May 2010)
- OMB clearance for interviews (Dec 2009 to June 2010)
- Implement and test the toolkit (Aug 2010 - July 2011)
- Evaluate implementation process and results (concurrent)
- Revise and finalize toolkit (Aug – Sept 2011)
- Final report and dissemination plan (Oct 2011)
- Journal manuscripts (Nov 2011)



# Questions and Suggestions?

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- H. Joanna Jiang, Ph.D.  
email [Joanna.jiang@ahrq.hhs.gov](mailto:Joanna.jiang@ahrq.hhs.gov)  
phone 301-427-1436
- Thanks.



# NEXT STEPS:

## How HRET Can Help you use your Data

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- If you are interested in having HRET work with you on your QI initiatives, please contact Jenny Shaw, HRET Program Manager, [jshaw@aha.org](mailto:jshaw@aha.org), (312) 422-4568.



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# Questions?



# Appendix A

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## List of AHRQ QIs



# Inpatient Quality Indicators (IQIs)

## ■ Volume Indicators

- Esophageal resection
- Pancreatic resection
- Abdominal Aortic Aneurysm (AAA) repair
- Coronary Artery Bypass Graft (CABG)
- Percutaneous transluminal coronary angioplasty (PTCA)
- Carotid endarterectomy

## ■ Utilization Indicators

- Cesarean delivery rate
- Primary cesarean delivery rate
- VBAC rate
- VBAC rate, uncomplicated
- Laparoscopic cholecystectomy rate
- Incidental appendectomy in the elderly rate
- Bilateral cardiac catheterization rate
- CABG (area level rate)
- PTCA (area level rate)
- Hysterectomy (area level rate)
- Laminectomy or spinal fusion (area level rate)



# Inpatient Quality Indicators (cont.)

## ■ Mortality Indicators for Inpatient Conditions

- Acute myocardial infarction (AMI)
- AMI, without transfer cases
- Congestive heart failure
- Gastrointestinal hemorrhage
- Hip fracture
- Pneumonia
- Acute stroke

## ■ Mortality Indicators for Inpatient Procedures

- AAA repair
- CABG
- Craniotomy
- Esophageal resection
- Hip replacement
- Pancreatic resection
- Carotid endarterectomy
- PTCA



# Patient Safety Indicators (PSIs)

- Death in low mortality DRGs
- Pressure ulcer
- Death among surgical inpatients with treatable serious complications
- Foreign body left during procedure \*
- Iatrogenic pneumothorax \*
- Central venous catheter-related bloodstream infection \*
- Postoperative hemorrhage or hematoma \*
- Postoperative hip fracture
- Postoperative physiological and metabolic derangement
- Postoperative PE or DVT

*\* The indicators are also provided as area-level indicators*



# Patient Safety Indicators (cont.)

- Postoperative respiratory failure
- Postoperative sepsis
- Postoperative wound dehiscence \*
- Transfusion reaction \*
- Accidental puncture or laceration \*
- Birth trauma – injury to neonate
- OB trauma – vaginal delivery with instrument (w/ and w/o 3<sup>rd</sup> degree lacerations)
- OB trauma – vaginal delivery without instrument (w/ and w/o 3<sup>rd</sup> degree lacerations)

*\* The indicators are also provided as area-level indicators*



# Pediatric Quality Indicators (PDIs)

## ■ Inpatient Indicators

- Accidental puncture and laceration
- Pressure ulcer
- Foreign body left in after procedure
- Iatrogenic pneumothorax in non-neonates
- Pediatric heart surgery mortality
- Pediatric heart surgery volume
- Postoperative hemorrhage or hematoma
- Postoperative respiratory failure
- Postoperative sepsis
- Postoperative wound dehiscence
- Transfusion reaction
- Central venous catheter-related bloodstream infection



# Pediatric Quality Indicators (Cont.)

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## ■ Area-Level Indicators

- Asthma admission rate
- Diabetes short-term complication admission rate
- Gastroenteritis admission rate
- Perforated appendix admission rate
- Urinary tract infection admission rate



# Neonatal Quality Indicators (NQIs)

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- Inpatient Indicators
  - Iatrogenic pneumothorax in neonates
  - Neonatal mortality
  - Central line bloodstream infection in neonates



# Prevention Quality Indicators (PQIs)

- Bacterial pneumonia
- Dehydration
- Urinary tract infection
- Perforated appendix
- Low birth weight
- Angina without procedure
- Congestive heart failure
- Hypertension
- Adult asthma
- COPD
- Diabetes complications - short term
- Diabetes complications - long term
- Uncontrolled diabetes
- Lower extremity amputation



# Appendix B

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## List of National Quality Forum endorsed AHRQ QIs



# National Quality Forum Endorsement: Overview

Currently, NQF endorsement in regard to:

## ■ 45 of the AHRQ QIs

- Inpatient Quality Indicators (IQIs): 12
- Patient Safety Indicators (PSIs): 10
- Prevention Quality Indicators (PQIs): 14
- Pediatric Quality Indicators (PDIs): 8
- Neonatal Quality Indicators (NQIs): 1

## ■ 3 AHRQ QI composites

- Mortality for selected conditions
- Patient safety for selected indicators
- Pediatric patient safety for selected indicators



# National Quality Forum Endorsement: IQIs

<b>IQI</b>	<b>Label</b>	<b>IQI</b>	<b>Label</b>
IQI 1	Esophageal Resection Volume	IQI 16	CHF Mortality
IQI 2	Pancreatic Resection Volume	IQI 17	Acute Stroke Mortality
IQI 4	Abdominal Aortic Aneurysm (AAA) Repair Volume	IQI 19	Hip Fracture Mortality
IQI 8	Esophageal Resection Mortality	IQI 20	Pneumonia Mortality
IQI 9	Pancreatic Resection Mortality	IQI 24	Incidental Appendectomy in the Elderly
IQI 11	Abdominal Aortic Aneurysm (AAA) Repair Mortality	IQI 25	Bilateral Catheterization



# National Quality Forum Endorsement: PSIs

PSI	Label	PSI	Label
PSI 2	Death in Low Mortality DRGs	PSI 12	Postoperative DVT or PE
PSI 4	Death Among Surgical Inpatients With Treatable Serious Complications	PSI 14	Postoperative Wound Dehiscence
PSI 5	Foreign Body	PSI 15	Accidental Puncture or Laceration
PSI 6	Iatrogenic Pneumothorax	PSI 16	Transfusion Reaction
PSI 11	Postoperative Respiratory Failure	PSI 17	Birth Trauma – Injury to Neonate



# National Quality Forum Endorsement: PDIs & NQIs

Indicator	Label	Indicator	Label
PDI 1	Accidental Puncture or Laceration	PDI 7	Pediatric Heart Surgery Volume
PDI 2	Decubitus Ulcer	PDI 11	Postoperative Wound Dehiscence
PDI 3	Foreign Body	PDI 13	Transfusion Reaction
PDI 5	Iatrogenic Pneumothorax	NQI 3	Blood Stream Infection in Neonates
PDI 6	Pediatric Heart Surgery Mortality		



# National Quality Forum Endorsement: PQIs

PQI	Label	PQI	Label
PQI 1	Diabetes, short-term complications	PQI 10	Dehydration
PQI 2	Perforated appendicitis	PQI 11	Bacterial pneumonia
PQI 3	Diabetes, long-term complications	PQI 12	Urinary infections
PQI 5	Chronic obstructive pulmonary disease	PQI 13	Angina without procedure
PQI 7	Hypertension	PQI 14	Uncontrolled diabetes
PQI 8	Congestive heart failure	PQI 15	Adult asthma
PQI 9	Low birth weight	PQI 16	Lower extremity amputations among patients with diabetes